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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/800,917	03/05/2001	Hossein Izadpanah	HRL080	5536

28848 7590 03/08/2007
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EXAMINER	
SEDIGHIAN, REZA	
ART UNIT	PAPER NUMBER
2613	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/08/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

5P

Office Action Summary	Application No.	Applicant(s)	
	09/800,917	IZADPANAH ET AL.	
	Examiner	**Art Unit**	
	M. R. Sedighian	2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 January 2007* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-51* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-51* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

1. This communication is responsive to applicant's remarks/arguments of 1/4/07 in the application of Izadpanah et al. for "Hybrid RF and optical wireless communication link and network structure incorporating it therein" filed 3/5/01. Claims 1-51 are now pending.

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-16, 18-24, 29-40, 42-46, and 49 are rejected under 35 U.S.C. 102(e) as being anticipated by Willebrand et al. (US Patent No: 6,763,195).

Regarding claim 1, Willebrand teaches a node (20, fig. 3) incorporating hybrid radio frequency and optical wireless communication links (26, 28, fig. 3), the node comprising: at least one laser portion (56, fig. 3) for transmitting data (col. 8, lines 32-55); at least one radio frequency portion (58, fig. 3) for transmitting data; a data receiver (60, fig. 3) for receiving data from a data source (col. 8, lines 32-55); and a controller (62, fig. 3) configured to receive data from a data source and connected with the laser portion and the radio frequency portion to allocate portions of the data to be transmitted through the laser portion and the radio frequency portion (col. 10, lines 43-47, col. 13, lines 51-65).

Regarding claims 2 and 8, Willebrand teaches the controller is configured as a binary switch such that the data is transmitted exclusively through either one of the laser portion or radio frequency portion (col. 13, lines 51-58, col. 15, lines 36-40 and 124, fig. 5).

Regarding claims 3-4, 7, and 9, Willebrand teaches the controller is configured to receive environmental information and wherein the portions of the data to be transmitted through the laser portion and the radio portion are adjusted by the controller based on the environmental information (col. 2, lines 31-45, col. 10, lines 18-20, col. 11, lines 63-67, col. 12, lines 1-13).

Regarding claim 5, Willebrand teaches the laser portion is configured to both transmit and receive and wherein the radio frequency portion is configured to both transmit and receive (col. 6, lines 28-30, col. 10, lines 14-16).

Regarding claims 6, 13, and 16, Willebrand teaches the laser portion and the radio frequency portion are configured to transmit in multiple channels (col. 1, lines 23-35, col. 5, lines 19-21, col. 6, lines 27-31 and fig. 2).

Regarding claims 10, 12, and 14, Willebrand teaches the laser portion and the radio frequency portion have transmit and receive strength, and wherein the controller is configured to monitor the transmit and receive strengths, and wherein the portions of the data to be transmitted through the laser portion and the radio frequency portion are adjusted by the controller based on their transmit and receive strengths (col. 13, lines 55-65, col. 14, lines 49-64).

Regarding claim 11, Willebrand teaches the controller includes a plurality of latches and a logic device, wherein the plurality of latches and logic device operate to provide adjustment levels for the portions of the data to be transmitted through the laser portion and the radio frequency portion (col. 14, lines 46-67, it is well known that a controller can include latches and logic devices to provide control and adjustment functions).

Regarding claim 15, Willebrand teaches the laser portion and the radio frequency portion are configured to transmit and receive in tandem, whereby the node may be configured to

provide a hybrid serial link to permit tailored radio frequency or optical network connections (col. 4, lines 58-67, col. 5, lines 1-21).

Regarding claim 18, Willebrand teaches a network (20, fig. 1) of plurality of nodes (22, 24, fig. 1), wherein each node (22, figs. 1, 3) includes: at least one laser portion for transmitting data (56, fig. 3); at least one radio frequency portion for transmitting data (58, fig. 3); a data receiver for receiving data from a data source (60, fig. 3); and a controller (127, fig. 5) configured to receive data from a data source and connected (72, fig. 3) with the laser portion (56, fig. 3) and the radio frequency portion (80, 58, fig. 3) to allocate portions of the data to be transmitted through the laser portion or the radio frequency portion (col. 14, lines 54-64).

Regarding claims 19, 32, and 43, Willebrand teaches the controller of each node is configured as a binary switch such that the data is transmitted exclusively through either one of the laser portion or the radio frequency portion (col. 13, lines 51-58, col. 15, lines 36-40 and 124, fig. 5).

Regarding claims 20-21, 29, 33, 42 and 45, Willebrand teaches the controller of each node is configured to receive environmental information, and wherein the portion of data to be transmitted through the laser portion or the radio frequency portion are adjusted by the controller based on the environmental information (col. 2, lines 31-45, col. 10, lines 18-20, col. 11, lines 63-67, col. 12, lines 1-13). As to claims 29 and 42, it further requires similar limitations, as recited in claim 18 above.

Regarding claims 22, 30, 34, 36, 38, and 44, Willebrand teaches the laser portion and the radio frequency portion of each node have transmit and receive strengths and wherein the controller is configured to monitor the transmit and receive strengths, wherein the portions of the

data to be transmitted through the laser portion and the radio frequency portion are adjusted by the controller based on their transmit and receive strengths (col. 13, lines 55-65, col. 14, lines 49-64).

Regarding claims 23, 31, 37, 40, and 46, Willebrand teaches the laser portion and the radio frequency portion of each node are configured to transmit in multiple channels (col. 1, lines 23-35, col. 5, lines 19-21, col. 6, lines 27-31 and fig. 2).

Regarding claims 24, 39, and 49, Willebrand teaches the laser portion and the radio frequency portion are configured to transmit and receive in tandem, whereby the node may be configured to provide a hybrid serial link to permit tailored radio frequency or optical network connections (col. 4, lines 58-67, col. 5, lines 1-21).

Regarding claim 35, Willebrand teaches the controller includes a plurality of latches and a logic device, wherein the plurality of latches and logic device operate to provide adjustment levels for the portions of the data to be transmitted through the laser portion and the radio frequency portion (col. 14, lines 46-67, it is well known that a controller can include latches and logic devices to provide control and adjustment functions).

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1, 5, 6, 15, 16, 18, and 23-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Perdue et al. (US Patent No: 6,529,556) in view of Taglione et al. (US Patent No: 5,966,225), or Nakamura (US Patent No: 6,583,908).

Regarding claims 1 and 18, Perdue teaches a node (10, fig. 1) incorporating hybrid radio frequency and optical wireless communication links (col. 2, lines 50-55), the node comprising: an IR portion (16, fig. 1) for transmitting data (col. 2, lines 15-17); a RF portion (17, fig. 1) for transmitting data (col. 2, lines 15-17); a data receiver (20, fig. 1) for receiving data from a data source (col. 2, line 16, col. 4, lines 10-17); and a controller (14, fig. 1) configured to receive data from a data source (20, fig. 1) and connected with the IR portion and the RF portion to allocate portions of the data to be transmitted through the IR portion and the RF portion (col. 2, lines 14-19, col. 5, lines 39-47 and 70, 72, fig. 4). Perdue differs from the claimed invention in that Perdue does not specifically disclose the IR portion is a laser. However, Perdue further teaches any one of a number of conventionally known IR transmitter arrangement may be used (col. 5, lines 23-25). It is well know to incorporate a laser for transmitting data signal, as such concept is taught by Taglione and Nakamura. Taglione teaches an IR transceiver (100, fig. 3 and col. 3, lines 47-56), wherein the IR emitter (108, fig. 3) can be a laser diode (col. 3, lines 53-54). Nakamura teaches infrared transmission/reception units (6a, 6b, 6c, figs. 1a, 1b and fig. 2) to transmit and receive light when performing data communication by a computer (col. 3, lines 3-10 and 1, fig. 2). Nakamura further teaches laser light may be used for the infrared transmission/reception unit (col. 5, lines 10-15). Therefore, it would have been obvious to a person of ordinary skill in the art at the time of invention to incorporate a laser transmitter, as it

is taught by Taglione or Nakamura, for the IR portion in the data transmission system of Perdue to generate a uniform, narrow, and relatively high power output light.

Regarding claims 5, Perdue teaches the IR portion is configured to both transmit and receive and the RF portion is configured to both transmit and receive (col. 2, lines 51-55, col. 9, lines 8-24, col. 10, lines 13-34).

Regarding claims 6 and 23, Perdue teaches the IR portion and the RF portion are configured to transmit and receive in multiple channels (col. 6, lines 23-34 and 76, 78 and 80, 82, fig. 5).

Regarding claims 15 and 24, Perdue teaches the IR portion and the RF portion are configured to transmit and receive in tandem (col. 2, lines 15-19).

Regarding claim 16, Perdue teaches the IR portion and the RF portion are configured to transmit and receive in multiple channels (col. 6, lines 23-34 and 76, 78 and 80, 82, fig. 5).

6. Claims 10, 12, 14, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Perdue et al. (US Patent No: 6,529,556) in view of Taglione et al. (US Patent No: 5,966,225), or Nakamura (US Patent No: 6,583,908) and in further view of Vollert (German Patent No: DE 44 33 896 C1).

Regarding claims 10, 12, 14, and 22, the modified data transmission system of Perdue and Taglione, or Nakamura differs from the claimed invention in that Perdue and Taglione, or Nakamura do not disclose the controller is configured to monitor the transmit and receive strengths. Vollert teaches bi-directional transmission and reception of information over radio link (FUS, fig. 1) or optical link (IUS, fig. 1) based on verification of the transmission quality of

different paths (translation page 5, last paragraph and page 6, first paragraph) by a controller (PST, fig. 1) and switching (translation page 6, lines 10-12) from one link to the other based on the evaluation and measurement results (translation page 6, lines 3-18). Therefore, it would have been obvious to a person of ordinary skill in the art to incorporate a controller such as the one of Vollert for the controller in the modified data transmission system of Perdue and Taglione to verify the transmission quality of the transmission paths.

7. Claims 11 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Perdue et al. (US Patent No: 6,529,556) in view of Taglione et al. (US Patent No: 5,966,225), or Nakamura (US Patent No: 6,583,908) and in further view of Vowell et al. (US Patent No: 5,999,295), or Shibuya (US patent No: 6,509,991).

Regarding claim 11, the modified optical transmission system of Perdue and Taglione, or Nakamura differs from the claimed invention in that Perdue and Taglione, or Nakamura do not disclose the controller includes a plurality of latches and a logic device to further provide adjustments levels for the portions of data to be transmitted. Vowell teaches an IR transceiver module that includes an IR transmitter and receiver and a communication logic that is coupled to the transceiver to control communication (col. 3, lines 5-8), wherein the communication logic includes state machines, buffers, latches, registers, memories, etc (col. 3, lines 8-10). Likewise, Shibuya teaches a transmit and receive control unit (10, fig. 6) that is comprised of latches (59, 60, 61, fig. 6) and logic devices (62, 63, fig. 6). Therefore, it would have been obvious to a person of ordinary skill in the art at time of invention that a controller such as the one of Perdue

can include latches and logic devices, as it is taught by Vowell or Shibuya, to provide monitoring and control functions.

Regarding claim 13, Perdue teaches the IR portion and the RF portion are configured to transmit in multiple channels (col. 6, lines 23-34 and 76, 78 and 80, 82, fig. 5).

8. Claims 17 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Willebrand et al. (US Patent No: 6,763,195) in view of Driessen (US Patent No: 5,936,578).

Regarding claims 17 and 41, Willebrand differs from the claimed invention in that Willebrand does not specifically disclose an optical reflector to deflect transmission from the IR portion to work around the fixed objects. However, it is well known to incorporate a reflector or a deflector along the path of communication to pass the light around an obstacle or an object. For example, Driessen teaches an optical transmission system (fig. 6), wherein an optical reflector is used to deflect transmission from a laser portion to work around fixed objects (col. 6, lines 1-7). As it is taught by Driessen, it would have been obvious to an artisan at the time of invention to incorporate an optical reflector along the path of transmission in the wireless data communication system of Willebrand to further continue signal transmission, when an obstacle or an object prevent the passage of light, so that the signal can reach a remote sight or a destination.

9. Claims 25-28, 47-48, and 50-51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Willebrand et al. (US Patent No: 6,763,195) in view of Medved et al. (US Patent No: 5,818,619), or Bloom (US Patent No: 6,323,980).

Regarding claims 25-28, 47-48, and 50-51, Willebrand differs from the claimed invention in that Willebrand does not specifically disclose a portion of the network is configured with a ring topology, or a SONET ring. Willebrand further teaches the I/O signal paths may be fiber optic or wire channels that connect the master and slave stations 22 and 24 to other wireless stations at the same location, thereby making the hybrid link 20 a repeater in a series of such hybrid links 20 in the communication network or system, and alternatively, the I/O signal paths 32 and 34 may be part of land-based fiber optic or wire communication links to distant land-based communication stations (col. 5, lines 10-20). Medved teaches wireless communication systems (80, 82, 84, fig. 5) can be applicable to any type of network such as ring network (col. 1, lines 35-40). Bloom teaches an optical transceiver (10, fig. 2) and a RF transceiver (13, fig. 2) can be used in a network with a SONET format (col. 5, lines 30-45). Therefore, as it is suggested by Willebrand, and as it is taught by Medved and Bloom, it would have been obvious to an artisan at the time of invention to incorporate the wireless data transmission system of Willebrand in a ring network, or in a SONET ring to provide and share information between other wireless devices on a network.

10. Claims 1-5, 8-9, 11, 15, 18-21, 24-26, 29-30, 32-33, 35, 39, 42-43, 45, and 49-51are rejected under 35 U.S.C. 102(e) as being anticipated by Acampora (US Patent No. 6,049,593).

Regarding claims 1, 18, 29, and 42, Acampora discloses a node incorporating hybrid radio frequency and optical wireless communication links (fig. 3a), the node comprising: at least one laser portion for transmitting data (optical transmitter 112, Fig. 3a, col. 6, lines 31-54, col. 15, lines 37-47, col. 23, lines 44-52 and col. 25, lines 10-20); at least one radio frequency portion

for transmitting data (RF transmitter 111, Fig. 3a); a data receiver (111, Fig. 3a) for receiving data from a data source (col. 5, lines 25-45); and a controller (ATM switch 117 and control processor 114, Fig. 3a) configured to receive data from a data source and connected with the laser portion and the radio frequency portion to allocate portions of the data to be transmitted through the laser portion and the radio frequency portion (col. 6, lines 31-54, col. 15, lines 37-47, col. 23, lines 44-52 and col. 25, lines 10-20 and col. 27, lines 37-56). As to claims 29 and 42, Acampora further teaches the controller is configured to receive environmental information and the portions of the data to be transmitted through the laser portion and the radio frequency portion are adjusted by the controller based on the environment information (col. 5, lines 10-22 and col. 25, line 10 to col. 27, line 56).

Regarding claims 2, 8, 19, 32, and 43, Acampora further teaches the controller (ATM switch 117 and control processor 114, Fig. 3a) is configured as a binary switch such that the data is transmitted exclusively through either one of the laser portion and the radio frequency portion (col. 6, lines 31-53 and col. 27, lines 37-56).

Regarding claims 3, 4, 9, 20-21, 33, and 45, Acampora further teaches the controller is configured to receive environmental information and the portions of the data to be transmitted through the laser portion and the radio frequency portion are adjusted by the controller based on the environment information (col. 5, lines 10-22 and col. 25, line 10 to col. 27, line 56).

Regarding claims 5 and 30, Acampora further teaches the laser portion is configured to both transmit and receive and wherein the radio frequency portion is configured to both transmit and receive (note that first and second transceivers each transmit and receive, respectively).

Regarding claims 11 and 35, Acampora further teaches the controller (control processor 114 and ATM switch, Fig. 3a) includes a plurality of latches and a logic device, wherein the plurality of latches and the logic device operate to provide adjustment levels for the portions of the data to be transmitted through the laser portion and the radio frequency portion (col. 6, lines 31-53, col. 15, lines 37-47 and col. 27, lines 37-56).

Regarding claims 15, 24, 39, and 49, Acampora further teaches the laser portion and radio frequency portion are configured to transmit and receive in tandem, whereby the node may be configured to provide a hybrid serial link to permit tailored radio frequency or optical network connections (col. 6, lines 35-53 and fig. 3a).

Regarding claims 25-26 and 50-51, Acampora further teaches a portion of the network is configured with a ring topology or SONET ring (col. 23, lines 49-50 and col. 24, line 47 and figs. 6, 7a, 10a, 10b).

11. Claims 6-7, 13, 16, 23, 27-28, 31, 37, 40, and 46-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Acampora (US Patent No. 6,049,593) in view of Kavehrad (the Article "A countermeasure to improve outage performance of interference-limited microwave radio links", Canadian Electrical & Computer Engінerring Journal, Vol. 16, No. 1, pp. 13-18, 1991).

Regarding claims 6, 13, 16, 23, 31, 37, 40, and 46, Acampora differs from the claimed invention in that Acampora does not specifically disclose the laser portion and the radio frequency portion are configured to transmit in multiple channels. Kavehrad teaches hybrid radio frequency and optical wireless links (fig. 1), wherein a laser portion and a radio frequency

portion are configured to transmit in multiple channels (page 14, Proposed hybrid architecture section, see lines 10-26). As it is taught by Kavehrad, it would have been obvious that the hybrid optical and wireless communication system of Acampora can transmit in multiple channels to transmit and receive a plurality of different channels to further increase the transmission capacity of the system.

Regarding claim 7, Acampora teaches the controller is configured to receive environmental information and the portions of the data to be transmitted through the laser portion and the radio frequency portion are adjusted by the controller based on the environment information (col. 5, lines 10-22, col. 25, line 10 to col. 27, line 56).

Regarding claims 27-28 and 47-48, Acampora teaches a portion of the network is configured with a ring topology or SONET ring (col. 23, lines 49-50 and col. 24, line 47 and figs. 6, 7a, 10a, 10b).

12. Claims 10, 12, 22, 34, 36, and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Acampora (US Patent No. 6,049,593) in view of Vollert (German Patent No: DE 44 33 896 C1).

Regarding claims 10, 12, 22, 34, 36, and 44, Acampora differs from the claimed invention in that Acampora does not specifically teach the laser portion and the radio frequency portion have transmit and receive strengths and the controller is configured to monitor the transmit and receive strengths, wherein the portions of the data to be transmitted through the laser portion and the radio frequency portion are adjusted by the controller based on their transmit and receive strengths. Vollert teaches bi-directional transmission and reception of

information over radio link (FUS, fig. 1) or optical link (IUS, fig. 1) based on verification of the transmission quality of different paths (Translation page 5, last paragraph and page 6, first paragraph) by a controller (PST, fig. 1) and switching (translation page 6, lines 10-12) from one link to the other based on the evaluation and measurement results (translation page 6, lines 3-18). Therefore, it would have been obvious to a person of ordinary skill in the art to incorporate a controller such as the one of Vollert for the controller in the data transmission system of Acampora to further verify the transmission quality of the transmission paths.

13. Claims 14 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Acampora (US Patent No. 6,049,593) in view of Kavehrad (Canadian Electrical & Computer Enginerring Journal, Vol. 16, No. 1, pp. 13-18, 1991) and further Vollert (German Patent No: DE 44 33 896 C1).

Regarding claims 14 and 38, the modified communication system of Acampora and Kavehrad differs from the claimed invention in that Acampora and Kavehrad do not specifically teach the laser portion and the radio frequency portion have transmit and receive strengths and the controller is configured to monitor the transmit and receive strengths, wherein the portions of the data to be transmitted through the laser portion and the radio frequency portion are adjusted by the controller based on their transmit and receive strengths. Vollert teaches bi-directional transmission and reception of information over radio link (FUS, fig. 1) or optical link (IUS, fig. 1) based on verification of the transmission quality of different paths (Translation page 5, last paragraph and page 6, first paragraph) by a controller (PST, fig. 1) and switching (translation page 6, lines 10-12) from one link to the other based on the evaluation and measurement results

(translation page 6, lines 3-18). Therefore, it would have been obvious to a person of ordinary skill in the art to incorporate a controller such as the one of Vollert for the controller in the data transmission system of Acampora modified by Kavehrad to verify the transmission quality of the transmission paths.

14. Claims 17 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Acampora (US Patent No. 6,049,593) in view of Driessen et al (US Patent No. 5,936,578).

Regarding claims 17 and 41, Acampora differs from the claimed invention in that Acampora does not specifically teach an optical reflector is used to deflect transmissions from the laser portion to work around the fixed objects. However, it is well known to incorporate a reflector or a deflector along the path of communication to pass the light around an obstacle or an object. For example, Driessen teaches an optical transmission system (fig. 6), wherein an optical reflector is used to deflect transmissions from a laser portion to work around the fixed objects (col. 6, lines 1-7). As it is taught by Driessen, it would have been obvious to an artisan at the time of invention to incorporate an optical reflector along the path of transmission in the wireless data communication system of Acampora to further continue signal transmission, when an obstacle or an object prevent the passage of light, so that the signal can reach a remote sight or a destination.

15. Claims 1-5, 8-12, 15, 18-22 and 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vollert (German Patent No: DE 44 33 896 C1) in view of Acampora (US Patent No: 6,049,593).

Regarding claims 1 and 18, Vollert discloses a node incorporating hybrid radio frequency and optical wireless communication links (fig. 1), the node comprising: at least one infrared portion for transmitting data (ISE, IUS, fig. 1); at least one radio frequency portion for transmitting data (A, FUS, fig. 1); a data receiver (SP, fig. 1) for receiving data from a data source (Translation, page 5, last paragraph); and a controller (PST, fig. 1) configured to receive data from a data source and connected with the infrared portion and the radio frequency portion to allocate portions of the data to be transmitted through the infrared portion and the radio frequency portion (Translation, page 5, last paragraph). Vollert differs from the claimed invention in that Vollert does not specifically disclose a laser portion. Acampora teaches a hybrid radio frequency and optical wireless links (fig. 3a), wherein optical signals are generated by laser portion (col. 23, lines 44-52 and col. 25, lines 10-20). Therefore, it would have been obvious to a person of ordinary skill in the art at the time of invention to incorporate a laser portion such as the one of Acampora, for the IR portion in the data transmission system of Vollert to generate a uniform, narrow, and relatively high power output signal.

Regarding claims 2, 8 and 19, the combination of Vollert and Acampora teaches the controller is configured as a binary switch such that the data is transmitted exclusively through either one of the laser portion and the radio frequency portion (Acampora, col. 6, lines 31-53 and col. 27, lines 37-56).

Regarding claims 3, 4, 9, 20 and 21, the combination of Vollert and Acampora teaches the controller is configured to receive environmental information and the portions of the data to be transmitted through the laser portion and the radio frequency portion are adjusted by the

controller based on the environment information (Acampora, col. 5, lines 10-22, col. 25, line 10 to col. 27, line 56).

Regarding claim 5, the combination of Vollert and Acampora teaches the laser portion is configured to both transmit and receive and wherein the radio frequency portion is configured to both transmit and receive (Vollert, FUS, IUS, fig. 1 and Acampora, fig. 3a).

Regarding claims 10, 12 and 22, Vollert teaches the laser portion and the radio frequency portion have transmit and receive strengths and the controller is configured to monitor the transmit and receive strengths, wherein the portions of data to be transmitted through the laser portion and the radio frequency portion are adjusted by the controller based on their transmit and receive strengths (Vollert, translation, page 6, lines 3-18).

Regarding claim 11, the combination of Vollert and Acampora teaches the controller (Acampora, for example control processor 114 and ATM switch, fig. 3a) includes a plurality of latches and a logic device, wherein the plurality of latches and the logic device operate to provide adjustment levels for the portions of the data to be transmitted through the laser portion and the radio frequency portion (Vollert, translation, page 5, last paragraph and Acampora, col. 6, lines 31-53, col. 15, lines 37-47 and col. 27, lines 37-56)

Regarding claims 15 and 24, the combination of Vollert and Acampora teaches the laser portion and radio frequency portion are configured to transmit and receive in tandem, whereby the node may be configured to provide a hybrid serial link to permit tailored radio frequency or optical network connections (Vollert, translation, page 8, last paragraph and Acampora, fig. 3a).

Regarding claims 25 and 26, the combination of Vollert and Acampora teaches a portion of the network is configured with a ring topology or SONET ring (Acampora, col. 23, lines 49-50 and col. 24, line 47 and figs. 6, 7a, 10a, 10b).

16. Claims 6, 7, 13, 14, 16, 23, 27 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vollert (German Patent No: DE 44 33 896 C1) in view of Acampora (US Patent No. 6,049,593) and further in view of Kavehrad (Canadian Electrical & Computer Enginerring Journal, Vol. 16, No. 1, pp. 13-18, 1991).

Regarding claims 6, 13, 16 and 23, the combination of Vollert and Acampora differs from the claimed invention in that Vollert and Acampora do not specifically disclose the laser portion and the radio frequency portion are configured to transmit in multiple channels. Kavehrad teaches a hybrid radio frequency and optical wireless communication system (fig. 1), wherein the laser portion and the radio frequency portion are configured to transmit in multiple channels (see page 14, Proposed hybrid architecture section, lines 10-26). As it is taught by Kavehrad, it would have been obvious that the hybrid optical and wireless communication system of Vollert modified by Acampora can transmit multiple channels to transmit and receive a plurality of different channels to further increase the transmission capacity of the system.

Regarding claim 7, the combination of Vollert , Acampora, and Kavehrad teaches the controller is configured to receive environmental information and the portions of the data to be transmitted through the laser portion and the radio frequency portion are adjusted by the controller based on the environment information (Acampora, col. 27, lines 37-56).

Regarding claim 14, Vollert teaches the laser portion and the radio frequency portion have transmit and receive strengths and the controller is configured to monitor the transmit and receive strengths, wherein the portions of the data to be transmitted through the laser portion and the radio frequency portion are adjusted by the controller based on their transmit and receive strengths (Vollert, translation, page 6, lines 3-18).

Regarding claims 27 and 28, the combination of Volllert, Acampora and Kavehrad teaches a portion of the network is configured with a ring topology or SONET ring (Acampora, col. 23, lines 49-50 and col. 24, line 47 and figs. 6, 7a, 10a, 10b and Vollert, translation, page 6, lines 3-18).

17. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Vollert (German Patent No: DE 44 33 896 C1) in view of Acampora (US Patent No. 6,049,593) and further in view of Driessen et al (US Patent No. 5,936,578).

Regarding claim 17, the combination of Vollert and Acampora differs from the claimed invention in that Vollert and Acampora do not specifically disclose an optical reflector to deflect transmissions from the laser portion to work around the fixed objects. However, it is well known to incorporate a reflector or a deflector along the path of communication to pass the light around an obstacle or an object. For example, Driessen teaches an optical transmission system (fig. 6), wherein an optical reflector is used to deflect transmissions from a laser portion to work around the fixed objects (col. 6, lines 1-7). As it is taught by Driessen, it would have been obvious to an artisan at the time of invention to incorporate an optical reflector along the path of transmission in the wireless data communication system of Vollert modified by Acampora to further continue

signal transmission, when an obstacle or an object prevent the passage of light, so that the signal can reach a remote sight or a destination.

18. Claims 1-5, 8, 9, 11 and 18-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato (US Patent No: 4,904,993) in view of Acampora (US Patent No: 6,049,593).

Regarding claims 1 and 18, Sato discloses a node incorporating hybrid radio frequency and optical wireless communication links (fig. 1), the node comprising: at least one optical portion for transmitting data (optical transmitter 14 and 13, fig. 1); at least one radio frequency portion for transmitting data (RF transmitter 12 and 11, fig. 1); a data receiver (data supply 15 and data generator 16, fig. 1) for receiving data from a data source; and a controller (switches 17 and 18 control the routing of data to either RF portion 12 or optical portion 14) configured to receive data from a data source (15, fig. 1) and connected with the optical portion and the radio frequency portion to allocate portions of the data to be transmitted through the optical portion and the radio frequency portion (col. 2, lines 25-47, 51-67 and col. 3, lines 1-3). Sato differs from claimed invention in that Sato does not specifically disclose the optical portion generates the optical signals by a laser. Acampora teaches a hybrid radio frequency and optical wireless links (fig. 3a), wherein the Infrared signals can be generated by laser (col. 23, lines 44-52 and col. 25, lines 10-20). Therefore, it would have been obvious to a person of ordinary skill in the art at the time of invention to incorporate a laser portion such as the one of Acampora, for the optical portion in the data transmission system of Sato to generate a uniform, narrow, and relatively high power output signal.

Regarding claims 2, 8 and 19, the combination of Sato and Acampora teaches the controller is configured as a binary switch such that the data is transmitted exclusively through either one of the laser portion and the radio frequency portion (Acampora, col. 6, lines 31-53 and col. 27, lines 37-56).

Regarding claims 3, 4, 9, 20 and 21, the combination of Sato and Acampora teaches the controller is configured to receive environmental information and the portions of the data to be transmitted through the laser portion and the radio frequency portion are adjusted by the controller based on the environment information (Acampora, col. 27, lines 37-56).

Regarding claim 5, the combination of Sato and Acampora teaches the laser portion is configured to both transmit and receive and the radio frequency portion is configured to both transmit and receive (Acampora, fig. 3a).

Regarding claim 11, the combination of Sato and Acampora teaches the controller (Acampora, for example control processor 114 and ATM switch in fig. 3a) includes a plurality of latches and a logic device, wherein the plurality of latches and the logic device operate to provide adjustment levels for the portions of the data to be transmitted through the laser portion and the radio frequency portion (Acampora, col. 6, lines 31-53, col. 15, lines 37-47 and col. 27, lines 37-56).

19. Claims 1-5, 8, 9, 11 and 18-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zavrel (US Patent No. 5,585,953) in view of Acampora (US Patent No. 6,049,593).

Regarding claims 1 and 18, Zavrel discloses a node incorporating hybrid radio frequency and optical wireless communication links (fig. 1), the node comprising: at least one infrared

portion for transmitting data (IR transmitter 24, fig. 1); at least one radio frequency portion for transmitting data (RF transmitter 12, fig. 1); a data receiver (data controller 16, fig. 2) for receiving data from a data source; and a controller (for example, switches 20 and 22, fig. 1) configured to receive data from a data source and connected with the infrared portion and the radio frequency portion to allocate portions of the data to be transmitted through the infrared portion and the radio frequency portion (col. 1, lines 62-67 and col. 2, lines 1-11). Zavrel differs from the claimed invention in that Zavrel does not specifically disclose the infrared signals are generated by a laser. Acampora teaches a hybrid radio frequency and optical wireless communication system (fig. 3a), wherein optical signals are generated by laser (col. 23, lines 44-52 and col. 25, lines 10-20). Therefore, it would have been obvious to a person of ordinary skill in the art at the time of invention to incorporate a laser portion such as the one of Acampora, for the IR portion in the data transmission system of Zavrel to generate a uniform, narrow, and relatively high power output signal.

Regarding claims 2, 8 and 19, the combination of Zavrel and Acampora teaches the controller is configured as a binary switch such that the data is transmitted exclusively through either one of the laser portion and the radio frequency portion (Acampora, col. 6, lines 31-53 and col. 27, lines 37-56).

Regarding claims 3, 4, 9, 20 and 21, the combination of Zavrel and Acampora teaches the controller is configured to receive environmental information and the portions of the data to be transmitted through the laser portion and the radio frequency portion are adjusted by the controller based on the environment information (Acampora, col. 27, lines 37-56).

Regarding claim 5, the combination of Zavrel and Acampora teaches the laser portion is configured to both transmit and receive and wherein the radio frequency portion is configured to both transmit and receive (Zavrel, fig. 1 and Acampora, fig. 3a).

Regarding claim 11, the combination of Zavrel and Acampora teaches the controller (Acampora, processor 114 and ATM switch, fig. 3a) includes a plurality of latches and a logic device, wherein the plurality of latches and the logic device operate to provide adjustment levels for the portions of the data to be transmitted through the laser portion and the radio frequency portion (Acampora, col. 6, lines 31-53, col. 15, lines 37-47 and col. 27, lines 37-56).

20. Applicant's arguments filed on 1/4/07 with respect to claims 1-51 have been fully considered but they are not persuasive.

Applicant argued that Willebrand does not disclose allocating portions of data to be transmitted through the laser portion and the radio frequency portion. Willebrand discloses (abstract, lines 4-7) the optical link provides the primary path for the data, and the RF link provides a concurrent or backup path for the network data. Willebrand further discloses (col. 1, lines 26-31) communicating data through a communication link having both a free-space optical path and a parallel wireless RF path, and data is transmitted over the higher capacity optical path when..., and the data is transmitted over the RF path. Willebrand further discloses (col. 2, lines 60-63) communicating the data in an optical signal transmitted through a free-space optical path... and communicating the data in a radio frequency (RF) signal transmitted through a free-space RF path. Willebrand further states (col. 3, lines 29-39) a free-space optical link ... for transmitting and receiving an optical signal therebetween containing the data ... a free-space RF

link portion ... for transmitting and receiving an RF signal therebetween containing the data. Willebrand further states (col. 3, lines 52-60) the data to be transmitted over the optical and RF paths ... A switch within the station ... routes the data between the optical link ... and routes the data between the RF link. Willebrand further states (col. 4, lines 66-67, col. 5, line 1) data contained in the optical and RF signals is thereby communicated between the two stations. Willebrand further discloses (col. 5, lines 21-29) optical path 26 serves as a communication path for the data transmission between the master and slave station, and RF path 28 serve as a data communication path in a Standby mode of operation, wherein in the standby mode the RF path carries the data. Willebrand further discloses (col. 6, lines 39-40) the processing of the optical and RF network data signals in the optical and RF paths. Willebrand further discloses (col. 14, lines 35-39) in another alternative implementation both the optical path 26 and the RF path 28 are fully utilized simultaneously for the communication of data. Willebrand further states (col. 14, lines 55 to 65) routing the data through the optical data I/O bus 72, and routing the data through the RF link portion. Willebrand also discloses (col. 16, lines 34-35) routing the data through the appropriate optical or RF path. Therefore, Willebrand does teach allocating portions of data to be transmitted through the laser portion and the radio frequency portion. Applicant further argued Willebrand does not teach the controller is configured to receive environmental information to further transmit the data through the laser portion and the RF portion based on environmental information. However, willebrand does teach such limitation, for examples, Willebrand, states (abstract, lines 7-11) when atmospheric conditions degrade the optical link to the point at which optical data transmission fails, the hybrid communication link switches to the RF link to maintain availability of data communications. Willebrand further states (col. 1, lines

28-34) the data is transmitted over the higher capacity optical path when favorable free-space atmospheric conditions prevail, and the data is transmitted over RF path when free-space atmospheric conditions have degraded. Willebrand further states (col. 2, line 65 to col. 3, line 3) the optical link is used to transmit the data whenever there is a benefit to using the optical path, and the RF link is used whenever atmospheric conditions in the optical path cause of the optical path to fail or degrade the transmission of the optical signals. Willebrand further states (col. 3, lines 45-47) when the optical path fails or degrades because of atmospheric influences, the data is routed for transmission by the RF transceivers over the RF path. Willebrand further states (col. 5, lines 22-42) the optical path 26 serves as the main or preferred communication path for the data transmitted .... The RF path 28 also serves as a reliable backup data communication path ... RF path 28 carries the data because the optical path 26 has failed in transmitting ... due to the degrading atmospheric or other influences in such as the light refractive influences of rain, fog, mist, snow, dust, or other severe weather condition. Willebrand further discloses (col. 11, line 64 to col. 12, line 12) under severe weather conditions, for example, either the master or slave .... switch the data communication to the RF link portion. Willebrand further discloses (col. 14, lines 7-12) the switching from the active to standby modes occurs automatically upon optical beam failure or degradation due to severe weather condition. Therefore, Willebrand does teach the controller is configured to receive environmental information to further transmit data through the laser portion and the RF portion based on environmental information.

As to Perdue reference, remark states Perdue does not disclose allocating portions of data for IR transmission and RF transmission. Perdue discloses a controller 14 which controls the overall operation of remote controller 10 (col. 4, lines 18-20) and which receives a user input and

generates an appropriate remote control signal to either IR transmitter 16 and/or RF transmitter 17 (col. 4, lines 38-40). Accordingly, from this teaching it is clear that remote controller 14 allocates portions of data for IR transmission and/or RF transmission through respective IR transmitter 16 and RF transmitter 17. Perdue further teaches remote controller 10 transmits the IR signal in time interval 70 and the RF signal in time interval 72 (70, 72, fig. 4). Accordingly portions of data transmitted optically and electrically at those time intervals. Therefore, controller 14 does allocate portions of data for IR transmission and/or RF transmission. As to Vollert reference, Vollert reference is used for the teaching that a controller can verify the transmission quality of an optical link or an RF link. Thus, it would have been obvious to incorporate such a controller for the controller in the IR and RF data transmission system of Perdue to verify the transmission quality of the links. As to the cited references of Taglione, Nakamura, and Vollert, each of the cited references is used for the teaching of a laser as an optical or an IR transmission source, since Perdue suggests that any one of a number of conventionally known IR transmitter arrangement can be used (see Perdue, col. 5, lines 23-25). Furthermore, it is well known to use a laser for transmitting data to provide a high speed data transmission system.

As to Acampora reference, remark states that Acampora does not teach allocation portions of data to be transmitted through the laser portion and RF portion. Acampora discloses a controller causes a command switch to route telecommunication traffic between an optical transmitter and a radio transceiver (col. 6, lines 43-45, col. 10, lines 32-35). Therefore, by routing telecommunication traffic between an RF transceiver and an optical transceiver, portions of traffic or data can be transmitted optically and/or electrically. Remark further states

Acampora does not disclose the controller is configured to receive environmental information and to further transmit based on environmental information. Acampora teaches tolerances are such that links can easily withstand extreme mechanical disturbances such as strong wind force (col. 5, lines 15-20). Acampora further teaches path loss in the communication link that are affected by atmospheric conditions (col. 25, lines 11-15, 28-30, 53-55, col. 26, lines 16-17). Acampora also discloses about misalignment of the transceivers to each other due to the wind or thermal expansion causing an angular displacement of either end of the link (col. 26, lines 16-18). Acampora also discloses back-up routes are established so that in the event of a link failure or interruption of the optical beam, alternate routing can be instantaneously affected with minimal information loss (col. 17, lines 34-37). Accordingly, based on this teaching, it is obvious that the transmission system of Acampora can detect environmental information and the controller can allocate portions of data for transmission over optical link or RF link based on the environmental information. As to a controller with a plurality of latches and logic devices, it is well known that an ATM switch such as the one of Acampora includes latches and logic devices to provide the switching functions. Acampora also teaches the laser portion and the RF portion are configured to transmit and receive in tandem (col. 7, lines 1-22). As to the network that is configured with a ring topology or SONET ring, Acampora teaches incorporating an OC-3 and higher data rate transceiver that can be used for optical transceiver of the network (col. 23, lines 45-50), for example, in a ring configuration (col. 13, lines 26-34, 47-52 and figs. 6, 7a, 10a, 10b). Acampora, also teaches transmit and receive in multiple channels (col. 19, lines 19-40) by incorporating a dual-spectrum telecommunication method (col. 7, lines 20-21).

As to Vollert reference, remark states Vollert does not teach allocating portions of data for transmission through a laser portion and RF portion. Vollert teaches a primary controller PST that controls the transmission of signal over an IR transmission path IUS or radio transmission path FUS. According to this teaching, controller PST allocates portions of data for transmission through the IR path and the RF path. As to receiving environmental information and controlling the transmission of data based on environmental data, Acampora discloses controlling the transmission of data based on receiving and detecting environmental data, as discussed above with respect to Acampora reference. As to a controller with a plurality of latches and logic devices, Vollert teaches a controller PST that converts the received digitized voice signal SP according to DECT standard. Therefore, controller PST includes electrical circuitries such as latches and logic devices to convert the digitized voice signal SP. It is well known that a controller such as controller PST of Vollert that provides functions such as signal conversion, signal evaluation, and signal monitoring, or a controller such as controller 114 of Acampora that causes the switch 117 to route the traffic data and that provides control and processing functions, each respectively include latches and logic devices to provide their intended functions.

As to Sato reference, remark states Sato does not disclose allocating portions of data to be transmitted through the laser portion and the radio frequency portion. Sato discloses data is output from a data generating circuit 16 through operation of a data selection circuit 15 and this data is switched by a switch 17 and is then given to any one of the radio signal sending circuit 12 or optical signal sending circuit 14 (col. 2, lines 30-34). Accordingly, switch 17 allocates or transmits portions of data to RF sending circuit and optical sending circuit. As to receiving

environmental information and to transmit data based on received environmental information, Acampora discloses control and allocating data based on received environmental information, as discussed above. As to latches and logic devices, is well known that electro-optical switches and controllers include circuitries such as latches and logic devices to provide their intended functions, as discussed above.

As to Zavrel reference, remark states Zavrel does not disclose allocating portions of data to be transmitted through the laser portion and the radio frequency portion. Zavrel discloses a node incorporating hybrid radio frequency and optical wireless communication links (fig. 1), wherein the node comprising of an infrared portion for transmitting data (IR transmitter 24, fig. 1) and a radio frequency portion for transmitting data (RF transmitter 12, fig. 1), and wherein a controller (for example, switches 20, fig. 1) is configured to switch the transmission of data through the IR path or RF path (col. 1, lines 62-67 and col. 2, lines 1-11). Accordingly, the controller or switch 20 allocates portions of data for transmission through respective IR or RF paths. As to receiving environmental information and to transmit data based on received environmental information, Acampora discloses control and allocating data based on received environmental information, as discussed above. As to latches and logic devices, is well known that electrical switches and controllers include circuitries such as latches and logic devices to provide control and switching functions.

21. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

22. Any inquiry concerning this communication or earlier communications from the examiner should be directed to M. R. Sedighian whose telephone number is (571) 272-3034. The examiner can normally be reached on 9 to 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would

like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

M. R. Sedighian

M. R. SEDIGHIAN
PRIMARY EXAMINER